REMARKS

Claims 1 and 17 have been amended. Claims 1-2, 4-18, and 20-37 remain pending, of which claims 17-18, 20-32 and 35-37 are withdrawn from consideration. Support for the instant amendments is provided throughout the as-filed application. Thus, no new matter has been added. Entry of the Amendment is proper under 37 C.F.R. §1.116 as the amendments: (a) place the application in condition for allowance for the reasons discussed herein; (b) do not present any new issues that would require further consideration and/or search as the amendments merely amplify issues discussed throughout the prosecution; (c) do not present any additional claims without canceling a corresponding number of claims; (d) place the application in better form for appeal, should an appeal be necessary; and (e) were not made earlier because they are made in response to the points first presented in the Final Action. Entry of the Amendment is thus respectfully requested along with withdrawal of the Final Action.

In view of the following comments, allowance of all the claims pending in the application is respectfully requested.

ALLOWABLE SUBJECT MATTER

Applicant appreciates the indication that claim 4 is allowable.

REJECTION UNDER 35 U.S.C. §103

Claims 1, 5-11, 33, and 34 were rejected under 35 U.S.C. §103(a) as allegedly being unpatentable by U.S. Patent No. 6,397,776 to Yang, *et al.* (hereinafter "Yang"). Applicant respectfully traverses this rejection.

Applicant submits that no *prima facie* case of obviousness has been established because the cited portions of Yang do not disclose, teach, or render obvious each and every claim aspect of independent claim 1, as amended.

Claim 1, as amended, recites a method for applying a coating on a substrate, comprising, *inter alia*: choosing different process parameters such that, after the coating process, addition of the deposition profile results in a substantially uniform layer thickness of the coating on a part of the substrate, wherein one of the process parameters to be chosen is the distance between two immediately adjacent ones of the sources, the sources producing plasma plumes at the same time; and setting the distance, arc flow, and pressure of the carrier gas such that the expanding plasmas substantially do not create an interference pattern in any area of overlap of the resulting layer, and such that the shapes of the plasma plumes substantially correspond to the shape of a single plasma plume in a corresponding process chamber under otherwise corresponding process conditions. Yang fails to disclose, teach, or suggest the recited features of claim 1, as amended.

The Examiner alleges that Yang discloses the arrangement of ETP sources as claimed, and that such an arrangement will provide at least two sources wherein the sources are spaced apart such that the ETP sources do not "substantially" influence each other (emphasis added). More specifically, it is the Examiner's position that "substantial" is a degree term and that the scope of "substantially do not influence" as recited in claim 1 is not defined. *See* Final Action, page 2. The Examiner thus alleges that Yang discloses two plumes that do not substantially interfere with each other and that correspond to the shape of a single plume, as allegedly shown in Yang at FIG. 12A. The Examiner also alleges that Yang discloses 1) that is it known to adjust the distance between the two plumes and 2) that the alleged zig-zag arrangement of the plasma plumes of Yang do not substantially interfere or overlap with each other and would form a uniform coating as claimed. *See* Final Action, page 3. Applicant respectfully disagrees, and respectfully submits that the Examiner is misinterpreting the disclosure and recited features of Yang.

One of the ways the claimed method solves the problem of providing a uniform thickness of deposition on the substrate is by avoiding substantial interference between neighboring plasma plumes [so that interference patterns are **not** created in the coating layer].

See, e.g., Applicant's Specification, page 8, lines 1-11 and/or paragraph [0030] of the corresponding '612 Publication. Such features are not explicitly disclosed in Yang.

As noted in the description of the application,

> For instance, **U.S. Pat. No. 6,397,776 B1 ignores** the fact that the plasma plumes of the ETP sources **will interfere with each other** and will push each other away. As a result of this phenomenon, **interference-like deposition patterns** have been found to arise between the sources, so that, there, the **layer thickness is not uniform**. The tables of tests included in the respective publication show considerable layer thickness differences. (Emphasis added.)

See Applicant's Specification, page 1, lines 16-22 or paragraph [0002] of the corresponding Application Publication, 2007/0269612 A1. The plumes of Yang intersect each other and there is an area of the substrate contacted by both plumes that will generate an interference pattern in the area of overlap. Applicant also submits that, therefore, the interference of the plasma plumes of Yang will not provide a uniform layer thickness in the sense claimed. As Applicant pointed out in the original specification of the invention with regard to Yang (copied above), "...interference-like deposition patterns have been found to arise between the sources, so that, there, the layer thickness is not uniform. The tables of tests included in the respective publication show considerable layer thickness differences." *See, e.g.,* Table I, column 9, lines 35-55 and Applicant's Specification, page 1, lines 17-22. Extensive testing has revealed that intersecting plasma plumes provide inference-like deposition patterns, so that, therefore, the layer thickness is not uniform. Thus, Applicant submits that Yang's sources would influence each other and would create an interference pattern in the areas of overlap in the resulting layer (which the claimed invention does not).

No where does Yang teach or suggest, "setting the distance, arc flow, and pressure of the carrier gas such that the expanding plasmas substantially do not create an interference pattern in any area of overlap of the resulting layer, and such that the shapes of the plasma plumes substantially correspond to the shape of a single plasma plume in a corresponding process chamber under otherwise corresponding process conditions," as recited in claim 1.

Yang is silent with regard to both interference pattern(s) in the resulting layer, as well as setting the distance, arc flow, and pressure of the carrier gas so that such interference pattern(s) are not created. Further, Applicant reiterates that Yang aims to overlap edge portions of the plurality of plasma plumes, which will cause formations of interference patterns. *See, e.g.,* Yang at column 6, lines 22-26.

Additionally, claim 1, as amended, recites that, "one of the process parameters to be chosen is the distance between two immediately adjacent ones of the sources, the sources producing plasma plumes at the same time." However, the Examiner's notation on pages 2-3 in the Final Action that an alleged "first and third plasma plumes" of Yang would not interfere with each other does not teach or suggest to two immediately adjacent sources producing plasma plumes at the same time that do not produce an interference pattern, as claimed.

Moreover, Applicant also submits that the claimed method limitations of "choosing different process parameters such that, after the coating process, addition of the deposition profile results in a substantially uniform layer thickness of the coating on a part of the substrate, wherein one of the process parameters to be chosen is the distance between two immediately adjacent ones of the sources, the sources producing plasma plumes at the same time; and setting the distance, arc flow, and pressure of the carrier gas such that the expanding plasmas substantially do not create an interference pattern in any area of overlap of the resulting layer, and such that the shapes of the plasma plumes substantially correspond to the shape of a single plasma plume in a corresponding process chamber under otherwise corresponding process conditions," are also not inherent in Yang. The fact that a certain result or characteristic *may* occur or be present in the prior art is not sufficient to establish the inherency of that result or characteristic. *In re Rijckaert*, 9 F.3d 1531, 1534, 28 USPQ2d 1955, 1957 (Fed. Cir. 1993) (reversed rejection because inherency was based on what would result due to optimization of conditions, not what was necessarily present in the prior art); *In re Oelrich*, 666 F.2d 578, 581-82, 212 USPQ 323, 326 (CCPA 1981). "To establish inherency, the extrinsic evidence 'must make clear that the missing descriptive matter is necessarily present in

the thing described in the reference, and that it would be so recognized by persons of ordinary skill. Inherency, however, may not be established by probabilities or possibilities. The mere fact that a certain thing may result from a given set of circumstances is not sufficient.' " *In re Robertson*, 169 F.3d 743, 745, 49 USPQ2d 1949, 1950-51 (Fed. Cir. 1999) (citations omitted).

For example, even though Yang notes that the precise amount of overlap will depend on numerous factors and that optimum spacings for each coating apparatus can be determined by experimentation, there is no explicit or implicit disclosure, teaching, or suggestion that the plumes of Yang are set at a distance, with an arc flow and pressure of the carrier gas such that the expanding plasmas substantially do not create an interference pattern in any area of overlap of the resulting layer, and such that the shapes of the plasma plumes substantially correspond to the shape of a single plasma plume, as recited in amended claim 1.

For at least these reasons, Yang fails to disclose, teach, or suggest the features of amended claim 1.

Claims 5-11, 33, and 34 depend from claim 1 and therefore are also patentable over Yang based on their dependency and for the additional features recited therein. Just for example, as noted in prior responses, Yang fails to provide "wherein the arc flow of the source located on the third angular point is chosen to be lower than the arc flows of the other two sources," as recited in claim 8 (which includes the features of claims 7, 6, 5, and 1, based on its dependency), and "wherein one of the process parameters to be chosen, and to be varied depending on the other process parameters, for influencing the resulting layer thickness uniformity is an arc flow of each of the at least two sources," and recited in claim 34. Yang merely mentions that an arc generator may be used. However, there is no disclosure, teaching, or suggestion that the arc flow of a source is varied or selected in Yang as recited in claims 8 and 34.

For at least the reason that the cited portions of Yang do not disclose, teach, or suggest the claimed aspects, the rejection of claims 1, 5-11, 33, and 34 should be withdrawn. Applicant respectfully requests indication that claims 1, 5-11, 33, and 34 are allowable over Yang.

Claims 2 and 12-15 were rejected under 35 U.S.C. §103(a) as allegedly being unpatentable over Yang in view of U.S. Patent No. 6,140,773 to Anders, *et al.* (hereinafter "Anders"). Applicant respectfully traverses.

Claims 2 and 12-15 depend from claim 1 and are patentable over Yang based on their dependency and for the additional features recited therein.

As admitted by the Examiner, Yang fails to disclose "measuring thickness variations over a surface of the substrate of the layer obtained after the coating process, and subsequently, adjusting the process parameters for reducing the measured thickness variations," as recited in claim 2. *See* Final Action, pages 7-8. Anders is recited as allegedly disclosing thickness control using feed back control. *Id.* The Examiner alleges that it would have been obvious to one of ordinary skill in the art to modify Yang to use the feedback control techniques of Anders, because doing so would have led to predictable and successful results. Applicant respectfully disagrees.

Applicant submits that no *prima facie* case of obviousness has been established because (1) there is no teaching, suggestion, or reason to combine the cited portions of Yang and Anders; and (2) the cited portions of Yang and Anders, even if combined, do not disclose, teach, or render obvious each and every claim aspect.

Even if Yang and Anders could be combined, which Applicant does concede, a combination thereof would fail to disclose, teach, or suggest at least, "choosing different process parameters such that, after the coating process, addition of the deposition profile results in a substantially uniform layer thickness of the coating on a part of the substrate, wherein one of the process parameters to be chosen is the distance between two immediately adjacent ones of the sources, the sources producing plasma plumes at the same time; and setting the distance, arc flow, and pressure of the carrier gas such that the expanding plasmas substantially do not create an interference pattern in any area of overlap of the resulting layer, and such that the shapes of the plasma plumes substantially correspond to the shape of a single

plasma plume in a corresponding process chamber under otherwise corresponding process conditions," as recited in claims 2 and 12-15. Anders fails to remedy the deficiencies of Yang. Anders merely notes that the spacing distance between cells of its sources may be determined by empirical measurements. However, the recited features of independent claim 1, from which claims 2 and 12-15 depend, are not disclosed, taught, or suggested by Anders.

Accordingly, any combination of Yang and Anders would fail to disclose, teach, or suggest the recited features of claims 2 and 12-15.

For at least the reason that the cited portions of Yang and Anders, either alone or in combination with one another, do not disclose, teach, or render obvious each and every claim aspect, the rejection of claims 2 and 12-15 should be withdrawn. Applicant respectfully requests acknowledgement that claims 2 and 12-15 are allowable over Yang, Anders, and/or a combination thereof.

Claim 11 was rejected under 35 U.S.C. §103(a) as allegedly being unpatentable over Yang in view of European Patent Application No. 985742 A2 (hereinafter "EP '742"). Applicant respectfully traverses.

Claim 11 depends from claim 1 and is patentable over Yang based on its dependency and for the additional features recited therein. Claim 11 recites, "wherein one of the process parameters to be chosen, and to be varied depending on the other process parameters, for influencing the resulting layer thickness uniformity is an outflow angle of plasma plumes relative to the substrate." The Examiner cites EP '742 as explicitly disclosing that controlling the plasma outflow angle provides certain benefits, and that adjusting such would have been obvious through routine experimentation. *See* Final Action, page 9. Applicant disagrees.

Applicant submits that no *prima facie* case of obviousness has been established because (1) there is no teaching, suggestion, or reason to combine the cited portions of Yang and EP '742; and (2) the cited portions of Yang and EP '742, even if combined, do not disclose, teach, or render obvious each and every claim aspect.

Even if Yang and EP '742 could be combined, which Applicant does concede, a combination thereof would fail to disclose, teach, or suggest at least, "choosing different process parameters such that, after the coating process, addition of the deposition profile results in a substantially uniform layer thickness of the coating on a part of the substrate, wherein one of the process parameters to be chosen is the distance between two immediately adjacent ones of the sources, the sources producing plasma plumes at the same time; and setting the distance, arc flow, and pressure of the carrier gas such that the expanding plasmas substantially do not create an interference pattern in any area of overlap of the resulting layer, and such that the shapes of the plasma plumes substantially correspond to the shape of a single plasma plume in a corresponding process chamber under otherwise corresponding process conditions," as recited in claim 11. EP '742 fails to remedy the deficiencies of Yang.

For example, EP '742 describes using a plurality of distribution heads 18 wherein a first distribution head 18 has a first central impingement point on a substrate 32 and a second distribution head 18 has a second central impingement point on the substrate 32, the second central impingement point being within a half of a profile width of the first central impingement point. *See, e.g.*, EP '742 at page 4, paragraphs [0017]-[0018] and [0020] and claim 6. That is, the distribution heads are preferably spaced relatively apart (from center to center) with respect to a defined profile width. As is clear from FIG. 3 of EP '742, the plasma plumes intersect. EP '742, therefore, likely provides a similar arrangement and interference problems as described above with respect to Yang.

For at least the reason that the cited portions of Yang and EP '742, either alone or in combination with one another, do not disclose, teach, or render obvious each and every claim aspect, the rejection of claim 11 should be withdrawn. Applicant respectfully requests acknowledgement that claim 11 is allowable over Yang, EP '742, and/or a combination thereof.

Claim 16 was rejected under 35 U.S.C. §103(a) as allegedly being unpatentable over Yang in view of Anders and further in view of Japanese Patent Application No. 09-111435 (hereinafter "JP '435"). Applicant respectfully traverses.

Applicant notes that U.S. Patent 5,731,030 is the U.S. equivalent to JP '435. For ease of explanation only, Applicant references the U.S. Patent 5,731,030 to Friese *et al.* (hereinafter "Friese") in the remarks below.

Claim 16 depends from claim 1 and is patentable over Yang based on its dependency and for the additional features recited therein. Claim 16 recites, "wherein the measurement of the layer thickness is performed by a temperature measurement of the substrate surface." The Examiner cites JP '435 (Friese) as explicitly disclosing, during plasma coating, measuring the substrate temperature provides an indication of the coating thickness, and, therefore, the Examiner submits that modifying Yang would have been obvious. *See* Final Action, page 9. Applicant respectfully disagrees.

Applicant submits that no *prima facie* case of obviousness has been established because (1) there is no teaching, suggestion, or reason to combine the cited portions of Yang, Anders, and Friese; and (2) the cited portions of Yang, Anders, and Friese, even if combined, do not disclose, teach, or render obvious each and every claim aspect.

Specifically, Friese fails to remedy the deficiencies of Yang, Anders, and/or a combination thereof. Friese fails to disclose, teach, or suggest at least, "choosing different process parameters such that, after the coating process, addition of the deposition profile results in a substantially uniform layer thickness of the coating on a part of the substrate, wherein one of the process parameters to be chosen is the distance between two immediately adjacent ones of the sources, the sources producing plasma plumes at the same time; and setting the distance, arc flow, and pressure of the carrier gas such that the expanding plasmas substantially do not create an interference pattern in any area of overlap of the resulting layer, and such that the shapes of the plasma plumes substantially correspond to the shape of a single

plasma plume in a corresponding process chamber under otherwise corresponding process conditions," as recited in claim 16, and then measuring the thickness of such layer.

For at least the reason that the cited portions of Yang, Anders, and JP '435 (Friese), either alone or in combination with one another, do not disclose, teach, or render obvious each and every claim aspect, the rejection of claim 16 should be withdrawn. Applicant respectfully requests acknowledgement that claim 16 is allowable over Yang, Anders, JP '435, and a combination thereof.

CONCLUSION

Having addressed each of the foregoing rejections, it is respectfully submitted that a full and complete response has been made to the outstanding Final Office Action and, as such, the application is in condition for allowance. Notice to that effect is respectfully requested.

If the Examiner believes, for any reason, that personal communication will expedite prosecution of this application, the Examiner is invited to telephone the undersigned at the number provided.

If an extension of time is necessary to prevent abandonment of this application, then such an extension of time is hereby petitioned for under 37 C.F.R. §1.136(a). Any fees required (including fees for net addition of claims) are hereby authorized to be charged to **Deposit Account No. 033975** (Ref. No. **008895-0325576**).

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